

CHAPTER B7
ELECTRICAL SAFETY

B0701. DISCUSSION

The purpose of this chapter is to provide guidance to assist in the identification of electrical hazards, and to prevent mishaps that could cause injuries and extensive damage to shipboard equipment and may compromise the ship's mission capabilities. Detailed technical guidance on electrical hazards and the potential for electric shock is contained in reference B7-1, chapter 300. Work involving electric tools, equipment and systems is inherently dangerous. Always use the principles of Operational Risk Management (ORM) when dealing with electricity. Details of ORM are found in reference B7-2.

B0702. RESPONSIBILITIES

a. **The commanding officer shall** authorize all work on energized equipment per reference B7-1.

b. **The safety officer shall:**

(1) Ensure electrical/electronic indoctrination training is provided for all newly reporting personnel per paragraph B0708. Coordinate with the electrical officer/electronics material officer to provide this training.

(2) Complete training per B0708d.

c. **The electrical officer/electronic maintenance officer shall:**

(1) Establish an electrical tool issue room per B0707.

(2) Ensure that all maintenance and repair is conducted per references B7-3 through B7-5.

(3) Ensure that the on-board CPR instructor is certified per B0708.

d. **The supply officer shall** ensure that all electrical tools/equipment received on board are turned over to the electrical tool issue room (Electrical Division for submarines) for a safety inspection prior to issue.

e. **Division officers shall:**

(1) Ensure that assigned personnel are trained per paragraph B0708.

(2) Ensure that all portable electrical equipment is visually inspected prior to use, and is electrically safety checked quarterly. Detailed technical guidance on portable electric equipment is contained in reference B7-1 (paragraph 300-2.7).

(3) Ensure that all personal electrical/electronic equipment is authorized for shipboard use. A list of prohibited equipment is contained in paragraph 300-2.7.3.6.9 of reference B7-1.

(4) Ensure that required personnel receive CPR training per paragraph B0708.

(5) Ensure that items open purchased or received from Navy supply are electrically safety checked prior to use.

(6) Ensure that all personnel experiencing electrical shock report to medical.

f. **All hands shall:**

(1) Request permission from their division officer prior to bringing personal electrical/electronic equipment aboard. This requirement does not apply to battery-operated equipment not capable of being plugged into ships' electrical service.

(2) Report any condition, equipment or material that is believed to be unsafe.

(3) Report any electrical shock to their division officer.

B0703. ELECTRICAL SAFETY ELEMENTS

a. Working on de-energized equipment. (B0704)

b. Working on energized equipment. (B0705)

c. Personal protective equipment (PPE). (B0706)

d. Portable electrical tool issue. (B0707)

e. General precautions for portable electrical equipment. (Chapters C9 and D5)

f. Training. (B0708)

g. Safety standards implementation. (Chapters C9 and D5 list the Electrical Safety Standards).

B0704. WORKING ON DE-ENERGIZED EQUIPMENT

a. Safety from electrical hazards can be ensured by completely de-energizing equipment. Electrical equipment should be de-energized by opening the power supply circuit breaker or switch and/or removing the fuses. Some equipment has more than one source of power, which requires multiple breakers or switches to be opened and/or multiple fuses to be removed. Tag out the circuit breaker switches and fuses. Check the equipment with a voltmeter to ensure that it is completely de-energized before maintenance begins.

(1) For technical requirements concerning work on de-energized equipment, see reference B7-1, paragraph 300-2.4.

(2) For tag out procedures see reference B7-5.

B0705. WORKING ON ENERGIZED EQUIPMENT

a. **Approval procedures.** Energized electrical equipment shall not be disassembled nor undergo any maintenance without approval of such action by the commanding officer, or in his absence, the Command Duty Officer (CDO). Exceptions to this policy are those cases where approved instructions issued by higher authority (equipment technical manuals, PMS, or an established troubleshooting procedure) permit opening or inspecting equipment in the course of performing maintenance, routine testing, taking measurements, or making adjustments that require equipment to be energized. Commanding officer permission is not required when checking equipment or circuits to verify de-energization.

b. **Energized circuit working procedures.** Technical procedures for working on energized equipment are contained in reference B7-1, paragraph 300-2.5.2.

c. Damaged equipment shall be considered energized.

B0706. PERSONAL PROTECTIVE EQUIPMENT (PPE)

a. Use only gloves that are marked with a colored label indicating the usage limitations. Reference B7-1, Table 300-2-1 contains further information on stock numbers, maximum safe voltage usage, and label colors.

b. Rubber insulating gloves shall be stowed in the box in which they came. Planned Maintenance System (PMS) shall be performed on the gloves prior to stowage. Other rubber electrical safety protection equipment shall be stowed in a clean, dry, oil-free location. Care should be taken not to fold the gloves, as folding will frequently result in cracks that will greatly reduce insulating capability of the material. For further information on glove damage causes, inspection, and maintenance refer to reference B7-1, paragraph 300-2.5.3.

B0707. PORTABLE ELECTRICAL TOOL ISSUE (Not applicable to submarines)

a. A centralized portable electrical tool issue room shall be established for issue of portable electrical tools. Larger ships may have more than one tool issue room.

b. Personnel assigned to issue portable electric tools shall perform visual inspections and quarterly safety testing of equipment per reference B7-1 (paragraph 300-2.7.5) prior to issue to personnel. Additional technical guidance on portable electric equipment is contained in reference B7-1 (paragraph 300-2.7).

c. Prior to issue of portable electric tools, the personnel assigned to issue tools shall brief the tool users on general precautions for portable electrical equipment per B0708, as well as issue any required personal protective equipment.

d. Certain divisions or work centers (those that contain electrical/electronic ratings) may be authorized to retain selected electrical tools or equipment in their permanent custody. These divisions will perform safety checks on their equipment at the required frequency. These divisions shall not issue portable electrical tools to other divisions or work centers.

e. Housekeeping items such as vacuum cleaners and floor buffers need not be retained in the electrical tool issue room.

f. Unsafe electrical tools should be clearly marked "OOC", be rendered incapable of being energized, and be kept in locked storage separate from the other tools. The only exceptions should be for those tools in which immediate repair is to be accomplished.

B0708. TRAINING

a. All personnel, when reporting aboard, shall receive indoctrination on basic electrical safety, including the requirements regarding use of personal protective equipment. Reference B7-1 may be used as a source of training material. The training shall also include recognizing symptoms of electrical shock, electrical shock trauma, and emergency first responder techniques.

b. Each ship shall have a certified American Red Cross/American Heart Association CPR instructor on board. At least 50 percent of all electrical/electronics associated ratings shall be certified in basic life support.

c. Personnel who man the portable electrical tool issue room shall complete the Electrical Tool Issue Room Watchstation 302 in the Safety Programs Afloat Personal Qualifications Standard (PQS), NAVEDTRA 43460-4A.

d. The safety officer shall complete watchstation 304 of the Safety Programs Afloat PQS within 16 weeks of assignment.

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REFERENCES

- B7-1 Naval Ship's Technical Manual (NSTM) Chapters 300, 302, 310, 313, 320, 330 and 400 (NOTAL)
- B7-2 OPNAVINST 3500.39, Operational Risk Management (NOTAL)
- B7-3 DOD-HDBK 289 (SH) 26 Nov 1986, "Lighting on Navy Ships" (NOTAL)
- B7-4 OPNAVINST 4790.4B, Maintenance and Material Management (3-M) Manual.
- B7-5 OPNAVINST 3120.32C, Standard Organization and Regulation of the U.S. Navy